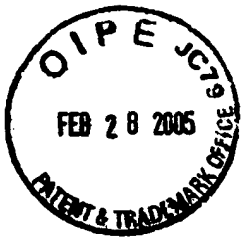


BARNES & THORNBURG LLP

600 One Summit Square
Fort Wayne, Indiana 46802
(260) 423-9440

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Customer No.:	**23641**
Application No.:	10/630875
Confirmation No.:	7941
Filing Date:	July 30, 2003
Attorney Docket No.:	29595/82608
First Named Inventor:	Garry E. Balthes
Group Art Unit:	1771
Examiner Name:	Jennifer A. Boyd
Title:	LAMINATED COMPOSITION FOR A HEADLINER AND OTHER APPLICATIONS

Certificate Under 37 CFR 1.8(a)

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450

on February 23, 2005

Zellma Grunden

Zellma Grunden

AFFIDAVIT PURSUANT TO 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I declare as follows:

1. I, Garry E. Balthes, am currently the President, Research, Development and Intellectual Properties at FlexForm Technologies, LLC. I have been employed at FlexForm Technologies, LLC since March of 2001.

2. I am a named inventor of the above-referenced patent application and I am, therefore, knowledgeable about the disclosure and claims therein.

3. I have experience with composite and laminated structure technologies. I have been developing and manufacturing such composites since August 1992. Prior to this date I served as Manager of Research and Development for 15 years mostly in mechanical construction, and have previously received both Canadian and United States Patents on mechanical inventions.

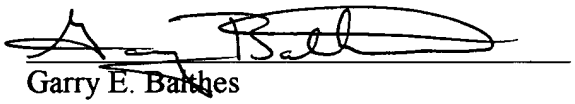
4. I understand that in the Office Action dated October 28, 2004, in the above-referenced application, the Examiner has rejected Claims 19-26 based, in particular upon the Porter reference (U.S. Patent #5,895,301). It is my understanding that the basis for this rejection is that the Examiner believes Porter discloses a cellulosic web that is being equated to the core layer recited in Claim 19. The Examiner is also equating the "scrim" of Porter to the claimed "woven fiber layer," the "impregnated cellulosic web" of Porter to the claimed "film layer," and the "low density adhesive layer" of Porter to the claimed "permeability-resistance film layer."

5. Upon review of the Porter reference, it is clear that it does not describe the claimed invention. It is understood that, as amended, Claim 19 now recites a "headliner core layer." The term "headliner" is a structural panel body that is located in the passenger compartment of a vehicle above the head of the occupant(s). The Porter reference is specifically directed to a "flexible, vapor-porous, cellulosic web made with inexpensive fibers ... [that] is easily hand torn like a paper product." (Col. 1, lines 62-65.) Specifically, the composite of Porter is used as housewraps, garments, and packaging. (See col. 1, line 20, and col. 2, lines 6-7.) Clearly, a laminate that is compared to an easily torn paper product is not equivalent to a headliner as specifically claimed in Claim 19. It is known by those in the automobile industry that there are specific mechanical properties required for head liner construction, which must meet specific testing requirements. Attached with this statement are copies of example headliner specifications from both Ford Motor Company and Johnson Controls. These specifications are in stark contrast to the requirement of Porter that its laminate "be torn by hand with no

more effort than that required to tear a piece of paper." (Col. 4, lines 14-15.) Clearly headliners and paper towels are different structures. Another distinction is that Claim 19 recites a film layer located on the first surface of the headliner core layer. In contrast, Porter discloses webs whose fibers are treated with a latex polymeric resin. (See col. 3, lines 18 and 19.) Individual fibers being treated with a resin is not a composite layer applied to the surface of a second layer. In Porter, it appears that the resin permeates throughout the body of the web, as evidenced by the statements that the resin narrows the pores through the webs. (See col. 3, lines 17-34.) This clearly indicates that the resin is intended to be absorbed in the body of the web, rather than be a layer that is located on the surface of a body.

6. The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Declared at Elkhart, Indiana, this 17th day of February, 2005.



Garry E. Balthes

State of Indiana)
) ss:
County of Elkhart)

On this 17th day of February, 2005, before me, a Notary Public in and for the County and State aforesaid, appeared Garry E. Balthes, to me personally known to be the same person whose name is subscribed to the foregoing instrument, and acknowledged that he executed said instrument as his free and voluntary act and for the uses and purposes therein expressed.

Katherine Groth
Notary Public
Katherine Groth
Printed Name

My Commission Expires: 9/17/10
County of Residence: St. Joseph

ENGINEERING MATERIAL SPECIFICATION

Material Name

HEADLINER, INTEGRAL AIR DUCT

Specification Number

WSB-M15P38-A

1 SCOPE

The material defined by this specification is a unitized formed assembly.

2. APPLICATION

This specification was released originally for the integral air duct headliner on the 1992 Econoline.

3. REQUIREMENTS

3.1 STATISTICAL PROCESS

Suppliers must conform to the requirements of Ford Quality System Standard Q-101. A mutually acceptable Control Plan as described therein is required for material/source approval. Appropriate statistical tools must be used to analyze process/product data so that variation in the final product is continuously reduced.

3.2 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

Ford Motor Company, at its option, may conduct infrared and/or thermal analysis of material/parts supplied to this specification. The IR spectra and thermograms established for initial approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. All samples shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

3.3 CONDITIONING AND TEST CONDITIONS

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 C and 50 +/- 5% relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

3.4	CONSTRUCTION	As specified on engineering drawing
3.5	WEIGHT	As specified on engineering drawing

Date	Release No.	Released
1994 08 16	NB00I10043054355	Released D. Ruona K. Minnich B. Ferns

WP 3948-a

3.6 BOND JOINT CONFIGURATION

3.6.1 12 mm overlap bond, min.

3.6.2 7 mm adhesive bead, nominal

3.7 90 DEGREE PEEL ADHESION, min
(ASTM D 903, except 90 degrees and 50 mm/minute)

Test Method: Cut separate 25 mm wide test pieces from the air duct headliner interface with the bond joint configuration of para 3.6. Condition one test piece for each exposure shown below. After exposure, pull at 90 degrees with a jaw separation rate of 50 mm/minute. Report adhesion values and mode of failure. Note: Adhesion values must be met irrespective of failure mode.

3.7.1	Original	26 N
3.7.2	At 85 +/- 2 C (Precondition for 30 minutes at 85 +/- 2 C)	26 N
3.7.3	After Heat Aging 7 days at 85 +/- 2 C	26 N
3.7.4	After the following cycle:	26 N

. 6 h at 85 +/- 2 C and 90 +/- 5 % Relative Humidity
. 6 h at - 35 +/- 2 C
. 12 h at 85 +/- 2 C
. 6 h at - 35 +/- 2 C
. 6 h at 85 +/- 2 C and 90 +/- 5 % Relative Humidity

BARRIER

3.8 AIR PERMEABILITY, max
(ASTM D 3574, Test G)

Duct	120 cm3/s
Headliner below duct area	120 cm3/s

BARRIER

3.9 FOGGING (Duct and Adhesive System)
(FLTM BO 116-03, 3 h at 100 C)

Fog Number, min 60

Formation of a clear film, droplets or crystals is cause for rejection.

3.10 ODOR (Duct and Adhesive System), max Rating 2
(SAE J1351)

3.11 ADDITIONAL REQUIREMENTS

Specific requirements for material and/or manufactured parts shall be specified on the Engineering drawing, Engineering parts specification, and/or performance specifications. All critical areas with respect to these properties shall be clearly designated on the Engineering drawing.

3.12 SUPPLIER'S RESPONSIBILITY

All materials supplied to this specification must be equivalent in all characteristics to the material upon which approval was originally granted.

Prior to making any change in the properties, composition, construction, color, processing or labelling of the material originally approved under this specification, whether or not such changes affect the material's ability to meet the specification requirements, the Supplier shall notify Purchasing, Toxicology, and the affected Materials Engineering activity of the proposed changes and obtain the written approval of the Materials Engineering activity. Test data, test samples and a new code identification are to be submitted with the request.

Substance restriction imposed by law, regulations or Ford, apply to the materials addressed by this document. The restrictions are defined in Engineering Material Specification WSS-M99P9999-A.

4. APPROVAL OF MATERIALS

Materials defined by this specification must have prior approval by the responsible Materials Engineering activity. Suppliers desiring approval of their materials shall first obtain an expression of interest from the affected Purchasing, Design and Materials Engineering activity. Upon request, the Supplier shall submit to the affected Materials Engineering activity a completed copy of their laboratory test reports, signed by a qualified and authorized representative of the test facility, demonstrating full compliance with all the requirements of this specification (test results, not nominal values), the material designation and code number, and test specimens for Ford evaluation. Ford's engineering approval of a material will be based on its performance to this specification and on an assessment of suitability for intended process and/or application. Upon approval, the material will be added to the Engineering Material Approved Source List.

JOHNSON CONTROLS

PRODUCT ENGINEERING SPECIFICATION: P00373

PROJECT: Standard Headliner Performance Specification

RELEASE DATE: **9/26/02**

ORIGINATION DATE: 10/31/00

APPROVALS

Title	Name	Date
Product Validation Director	Scott Spykerman	9/26/02
Product Engineering Director	David Ozios	9/26/02
Product Engineering Chiefs, OHP	John Cekander	9/26/02
	Michael Scile	9/26/02
	Dave Ernst	9/26/02
	William Homik	9/26/02
Product Validation Manager	Arnie Suigussaar	9/26/02
Product Validation Test Engineer	Pam Morris	9/26/02

Revision Level	Description of Revision	Date
A	Initial Release	1/2/01
B	Revised per review of all interior components: - Signature approval page changed to add Director of Engineering and Director of Validation. - High temp segment of environmental cycle changed from 90C to 85C. - Heat age temp changed from 88C to 85C. - Fogging test removed, moved to Standard Material & Finish Durability Specification. - Odor test removed, moved to Standard Material & Finish Durability Specification. - Created section for Material Characterization, moved 3 tests to that	6/4/01

	section (Finished Mass, Strength, Stiffness, & Toughness, and Rigidity). - Added one test to the Material Characterization section (Cantilever Sag).	
C	Revised coupon size on three tests to match 3" x 12" die: - Humidity resistance coupon changed to 305 mm from 400 mm - SST coupon changed from 300 mm to 305 mm - Cantilever sag coupon changed from 300 mm to 305 mm	7/17/01
D	Revised acceptance criteria on Bond Strength test to include cohesive failure of cover stock foam.	8/23/01
E	Corrected TM call out on Indentation & Recovery to TM-OHS-011 from 029 and on Rigidity to TM-OHS-016 From 015.	4/19/02
F	Added DMA 3-point bend test to Material Characterization section for Developmental testing.	9/26/02

Table of Contents

I. Scope

This specification describes the performance requirements for a typical headliner. It is intended to contain requirements that are "real world" and result in excellent field performance. The requirements were developed with the intention to represent a 10 year, 150,000 mile life by the 95th percentile user. This specification also uses DFMEA, field studies and warranty history as input where applicable.

The sample sizes and reliability levels (R/C) required are addressed in the test plans (DVP&R) of specific programs and are not included in this performance specification.

II. General Requirements

1. Environmental Cycle

Parameters: With the headliner mounted in vehicle position with design-representative attachments and mating components, expose to the following profile:

2.5 hr ramp
5.5 hrs @ 85° C
2.5 hr ramp
5.5 hrs @ -30° C
2.5 hr ramp
5.5 hrs @ 38°C / 95% RH
Run a total of 7 times
Note: The profile can be started at any step, humidity should be considered as the starting point for glued-in headliners.

Test Method: TM-GEN-002

Requirements: There shall be no objectionable distortion, color change, staining, delamination, or other undesirable effects. Sag must not exceed 6 mm on unsupported edges, 10 mm on other surfaces.

2. Heat Age

Parameters: Expose whole headliners to 85° C for 168 hrs.

Test Method: TM-GEN-010

Requirements: There shall be no objectionable staining, delamination, or other undesirable effects. Color change must be rated 4 or better per ISO/ AATCC gray scale.

III. Specific Requirements

1. Bond Strength

Parameters: Test bond strength of cover stock to substrate in original condition and after environmental, humidity age, heat age, and hydrolytic stability (if applicable).

Test Method: TM-GEN-023

Requirements: 12N/50mm, or cohesive failure of substrate or cover stock foam.

Alternate test method for deep draw areas: TM-OHS-27

Requirements: Cohesive failure of the substrate or cover stock foam. A clean removal of the cover stock without affecting the substrate or cover stock composite is indication of a poor bond.

2. Resistance to Humidity

Parameters: 75mm x 305 mm specimens, 168 hrs at 38C, 95% RH

Test Method: TM-GEN-002

Requirements: No delamination, degradation of foam, or spotty or non-uniform staining.

3. Dimensional Stability

Parameters: 38C, 98% RH for 24 hrs soak 88C for 24 hour

Test Method: SAE J315 (part 15), Method A followed by Method C

Requirements: +/- 0.5% expansion or contraction

4. Indentation & Recovery

Parameters: 22N applied with a 12mm diameter ball

Test Method: TM-OHS-011

Requirements: 100% recovery in 24 hours.

5. Hydrolytic Stability (For polyurethane materials only)

Parameters: 168 hours at 88C

Test Method: TM-OHS-30

Requirements: No delamination or foam degradation.

6. Acoustics (For those programs which require acoustic property evaluation)

Parameters: Standard laboratory conditions

Test Method: ASTM C423 (Preferred method)
ASTM E1050

Requirements: Report the results

7. Air permeability (For those programs which require non-permeability, such as those which use the headliner as a part of an airduct.)

   Parameters: Standard laboratory conditions

   Test Method: ASTM D3574, test G

   Requirements: 120 cm^3/sec max.

8. Shore hardness (Only for those programs which are exported and ECE Reg. 21 applies)

   Parameters: Test samples greater than 6mm thick. Test B-surface of substrate if possible, otherwise C-surface.

   Test Method: ASTM D2240

   Requirements 50 or greater on the Shore A scale

IV. Safety Requirements

1. FMVSS 302 (For U.S. domestic vehicles only)

   Parameters: Determine the burn resistance of all components within ½ inch of the occupant airspace.

   Test Method: TM-GEN-016

   Requirements: The individual components and composites shall not burn or transmit a flame front across its surface at a rate more than 100 mm/min.

2. Interior Fittings: ECE Regulation 21 (For export vehicles only)

   Parameters: Initial condition

   Test Method: ECE Regulation 21

   Requirements: All head-contactable surfaces (of Shore A hardness greater than 50) must have 3.2 mm radii minimum.

V. Finish Durability – Refer to Standard Material & Finish Durability Performance Specification.

VI. Material Characterization – These tests are for material and product evaluation, and are for evaluation only. Specific values for acceptance criteria may be developed for any program, but are not common across all headliners.

1. Finished Mass

   Parameters: Weigh samples and report the results

   Test Method: SAE J860

   Requirements: Report the results

2. Strength, Stiffness, & Toughness

Parameters: 75mm x 305mm samples

Test Method: TM-OHS-028

Requirements: Report the results

3. Cantilver sag

Parameters: 75mm x 305mm specimens in MD and AMD unless it can be shown there is no effect on results. Support 25mm with a 280mm overhang. Measure pre- and post- environmental exposure.

Expose to 24 hours of the following profile:

2.5 hr ramp
5.5 hrs @ 85 C
2.5 hr ramp
5.5 hrs @ -30 C
2.5 hr ramp
5.5 hrs @ 38 C/95% RH

Test Method: TM-OHS-005

Requirements: Report sag and thickness of the specimen in mm. Report any warping or other detrimental effects.

4. Rigidity

Parameters: Complete headliners

Test Method: TM-OHS-016

Requirements: Report the results

5. DMA

Parameters: 12.7mm x 60mm specimens without fabric in MD and AMD unless it can be shown there is no effect on results. Expose samples to DMA, 3-point bend:

-50°C to 120°C at 2° per minute
1 Hz 15mm amplitude
0.1 N static force

Test Method: ASTM D5023
ASTM E1640

Requirements: Plot complex modulus vs. temperature, and Tg, average of 3 samples.

Test Name: JCI Strength, Stiffness, Toughness (SST) Test

Laboratory Manager Approval: Scott Spykerman **Date:** 4/9/01

Lead Test Engineer Approval: Arnie Suigussaar **Date:** 4/9/01

Revisions

Level	Date	Description	Originator
A	4/9/01	Initial Release	Arnie Suigussaar

1.0 Purpose and Scope

The purpose of this test is to measure flex properties of headliner samples. It can be used for any type of headliner provided the samples are flat and can provide a 3" x 12" sample. An alternate sample size is 3" x 8".

2.0 Equipment/Apparatus

2.1 Steel rule die 3" x 12" (or 3" x 8")
2.2 Clicker press
2.3 Instron testing machine

3.0 Test Procedure

3.1 Cut headliner coupons on clicker press. Place headliner on bottom platen of press, fabric side up. Place die on top of sample with blades down.
3.2 Instron set-up:

a) Set span at 152mm (6 inch)
b) Roller diameter of 19mm (0.75 inch)
c) Test with fabric side down
d) Instron speed of 50 mm/min
e) Measure the thickness of the substrate only, using a micrometer with a clutch. Peel back the foam near the center line if possible. (For non-wovens without foam on the coverstock, measure the entire thickness)

Stiffness is defined as the initial steepest slope of the force – displacement curve. Stiffness is analogous to the elastic modulus but is not independent of sample size or geometry.

Strength is the offset yield strength from the flexural load – displacement curve. Set the offset yield at 1.27 mm (0.05")

Toughness is defined as the load at 1" displacement, divided by the offset yield load, multiplied by 100%. (Subtract the toe slack)

3.3 Test samples and report the results.